PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference IVAV-0056	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/US05/00612	International filing date *(day/month/year)* 07 January 2005 (07.01.2005)	Priority date *(day/month/year)* 09 January 2004 (09.01.2004)

International Patent Classification (IPC) or national classification and IPC IPC(7): G06K 9/36, 9/40, 9/46 and US Cl.: 382/248, 275

Applicant AYSCOUGH VISUALS LLC

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of __6__ sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

   a. ☐ *(sent to the applicant and to the International Bureau)* a total of _____ sheets, as follows:

      ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) _____ , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

   ☒ Box No. I   Basis of the report

   ☐ Box No. II   Priority

   ☒ Box No. III   Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

   ☐ Box No. IV   Lack of unity of invention

   ☒ Box No. V   Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

   ☐ Box No. VI   Certain documents cited

   ☐ Box No. VII   Certain defects in the international application

   ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand 08 August 2005 (08.08.2005)	Date of completion of this report 06 February 2006 (06.02.2006)

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Form PCT/IPEA/409 (cover sheet)(April 2005)

Box No. I   Basis of the report

1. With regard to the **language**, this report is based on:

   ☐ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of:

   ☐ international search (under Rules 12.3 and 23.1(b))

   ☐ publication of the international application (under Rule 12.4(a))

   ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

   ☒ the international application as originally filed/furnished

   ☒ the description:
   pages   1-23_____   as originally filed/furnished
   pages* NONE_____   received by this Authority on _____
   pages* NONE_____   received by this Authority on _____

   ☒ the claims:
   pages   24-33_____   as originally filed/furnished
   pages* NONE_____   as amended (together with any statement) under Article 19
   pages* NONE_____   received by this Authority on _____
   pages* NONE_____   received by this Authority on _____

   ☒ the drawings:
   pages   1/6/-6/6   as originally filed/furnished
   pages* NONE_____   received by this Authority on _____
   pages* NONE_____   received by this Authority on _____

   ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

   ☐ the description, pages_____

   ☐ the claims, Nos_____

   ☐ the drawings, sheets/figs_____

   ☐ the sequence listing (*specify*):_____

   ☐ any table(s) related to the sequence listing (*specify*):_____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

   ☐ the description, pages_____

   ☐ the claims, Nos_____

   ☐ the drawings, sheets/figs_____

   ☐ the sequence listing (*specify*):_____

   ☐ any table(s) related to the sequence listing (*specify*):_____

* *If item 4 applies, some or all of those sheets may be marked "superseded."*

Box No. III   Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application

☒ claims Nos. 1, 4/1, 5/1, 6/1, 7/1, 8/1, 9/8/1, 10-14, 19, 20, 34, 35, 37

   because:

☒ the said international application, or the said claim Nos. 1, 4/1, 5/1, 6/1, 7/1, 8/1, 9/8/1, 10-14 relate to the following subject matter which does not require an international preliminary examination *(specify)*:

☒ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. 19,20,34 and 35 are so unclear that no meaningful opinion could be formed *(specify)*:

☐ the claims, or said claims Nos. _____ are so inadequately supported by the description that no meaningful opinion could be formed *(specify)*:

☐ no international search report has been established for said claims Nos. _____

☐ a meaningful opinion could not be formed without the sequence listing; the applicant did not, within the prescribed time limit:

   ☐ furnish a sequence listing on paper complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Preliminary Examining Authority in a form and manner acceptable to it.

   ☐ furnish a sequence listing in electronic form complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Preliminary Examining Authority in a form and manner acceptable to it.

   ☐ pay the required late furnishing fee for the furnishing of a sequence listing in response to an invitation under Rules 13*ter*.1(a) or (b) and 13*ter*.2.

☐ a meaningful opinion could not be formed without the tables related to the sequence listings; the applicant did not, within the prescribed time limit, furnish such tables in electronic form complying with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions, and such tables were not available to the International Preliminary Examining Authority in a form and manner acceptable to it.

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in electronic form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.

☐ See Supplemental Box for further details

Form PCT/IPEA/409 (Box No. III) (April 2005)

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	9, 16-18, 23, 36	YES
	Claims	2-8, 15, 21-22, 24-33	NO
Inventive Step (IS)	Claims	2-18, 21-33, 36	YES
	Claims	NONE	NO
Industrial Applicability (IA)	Claims	2-18, 21-33, 36	YES
	Claims	NONE	NO

2. Citations and Explanations (Rule 70.7)

---------------- NEW CITATIONS ----------------

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

Claims 2-8, 15, 21-22, 24-33 lack novelty under PCT Article 33(2) as being anticipated by Banham et al "A Selective Update Approach to Matching Pursuits Video Coding".

With regard to claim 2, 26, 27, 29, and 32, Banhan teaches a method of data compression comprising: a) applying a transform to multi-dimensional data to generate a multi-dimensional transform data set (page 119, column 2, lines 35-37); b) convolving the transform data set with each of a plurality of first one-dimensional basis functions to generate a corresponding plurality of convolved data sets (page 121, column 2, second to the last paragraph); c) determining a location in a first direction across all the convolved data sets, and a first basis function, representative of a greatest magnitude (page 121, last paragraph into page 122, line 7); d) representing part of the transform data surrounding the location with an atom derived from the first and second basis functions corresponding to the greatest determined magnitudes (page 122, column 1, step 1); e) subtracting the atom from the transform data set to create a new data set (page 122, column 1, step 2); f) repeatedly updating the convolved data sets by convolving any changed part of the transform data set with each of the plurality of first one-dimensional basis function, and then re-applying steps (c) and (d) (page 122, column 1, step 3); and g) outputting a transform data coded versions of the atoms derived at step (d) (output from step 3).

With regard to claim 3, Banham teaches that the coded version of each atom includes magnitude, position in transform data set and number of basis function (page 121, column 1 last paragraph-column 2, line 13).

With regard to claim 4, Banham teaches the data to be compressed represents video image data (title).

With regard to claim 5, Banham teaches that the data to be compressed represents a still image (each frame in video).

With regard to claim 7, Banham teaches one dimension of the transform data represents time (figure 2).

With regard to claim 8, Banham teaches the transform is frequency-separating transform (figure 2).

With regard to claim 15, Banham teaches applying a function map to the convolved data sets before determining the location of

Supplemental Box

greatest magnitude (page 122, column 2, line 1-page 123, column 1, line 2).

With regard to claim 21, Banham teaches that the second one-dimensional basis functions extend in the spatial domain (page 122, eq. 6).

With regard to claim 22, Banham teaches that the second one-dimensional basis functions extend in the time domain (figure 1).

With regard to claim 24, Banham teaches that the second basis function representative of the greatest magnitude is determined without further searching in the region of the location (page 122, column 1, lines 7-9).

With regard to claim 25, Banham teaches that the second basis function representative of the greatest magnitude is determined at least partly by searching a local area in the region of the location (page 123, column 1, lines 3-11).

With regard to claim 28, Banham teaches a method of data compression comprising applying a transform to multidimensional data to generate a multi-dimensional transform data set (figure 1 and page 119, column 2, lines 35-37), and coding the transform data set by applying a one or more one-dimensional matching pursuits algorithm (II. Matching Pursuits for Video Coding).

With regard to claim 30, Banham teaches means for convolving the transform data at the location with each of the plurality of second one-dimensional basis function and means for determining a second basis function representative of a greatest magnitude; and in which the means for representing part of the transform data further operates upon the second basis functions (page 122, column 2, line 1-page 123, column 1, line 2).

With regard to claim 31, Banham teaches a coder for data compression comprising: means for applying a transform to multi-dimensional data to generate a multi-dimensional transform data set (page 119, column 2, lines 35-37); means for convolving the transform data set with each of a plurality of first one-dimensional basis functions to generate a corresponding plurality of convolved data sets (page 121, column 2, second to the last paragraph); means for determining a first location in a first direction across all the convolved data sets, and a first basis function representative of a greatest magnitude (page 121, last paragraph into page 122, line 7); and representing part of the transform data surrounding the first location with a first atom derived from the first function corresponding to the greatest determined magnitude (page 122, column 1, step 1).

With regard to claim 33, Banham teaches a coder (figure 4).